

CLAIMS:

1. A lamp assembly, comprising:
a reflector having an opening defined by an upper rim and a concave reflective surface surrounded by the upper rim;
an illumination element mounted within the opening of the reflector;
an air guide conduit extending around the upper rim of the reflector, the air guide conduit having an air inlet and having an air outlet into the opening of the reflector; and
a blower operatively connected to the air inlet of the air guide conduit.
2. The lamp assembly as claimed in claim 1, wherein the air outlet of the air guide conduit is adjacent an inner periphery of the upper rim of the reflector.
3. The lamp assembly as claimed in claim 2, wherein the air outlet extends circumferentially adjacent the inner periphery of the upper rim of the reflector.
4. The lamp assembly as claimed in claim 3, wherein the air guide conduit includes an inner side wall extending adjacent to and spaced from an inner periphery of the upper rim of the reflector, and wherein the air outlet is defined between the upper rim of the reflector and the inner side wall of the air guide conduit.
5. The lamp assembly as claimed in claim 1, wherein the concave reflective surface defines a parabolic or elliptical opening in the reflector.
6. The lamp assembly as claimed in claim 1, wherein the air guide conduit circumferentially overlaps the opening in the reflector.
7. The lamp assembly as claimed in claim 6, wherein the air outlet is located at the circumferential overlap between the air guide conduit and the opening in the reflector.

8. The lamp assembly as claimed in claim 1, wherein the opening in the reflector faces towards an optical modulator of a projection display device.

9. The lamp assembly as claimed in claim 1, wherein the air guide conduit comprises an outer wall extending circumferentially around an outer periphery of the upper rim of the reflector, and an inner side wall extending circumferentially around an inner periphery of the upper rim of the reflector.

10. The lamp assembly as claimed in claim 9, wherein the inner side wall partially extends into the opening and is spaced from the inner periphery of the upper rim to define the air outlet there between.

11. A lamp assembly comprising:
a reflector having an opening defined by an upper rim and a concave reflective surface surrounded by the upper rim;
an illumination element mounted within the opening of the reflector; and
cooling means for introducing a vortex tangentially into the opening such that the vortex travels down the concave reflective surface of the reflector.

12. The lamp assembly according to claim 11, wherein the illumination element is coaxially mounted within the opening of the reflector, and wherein said cooling means introduces the vortex into the opening such that the vortex is reflected from a bottom of the concave reflective surface back towards the upper rim of the reflector.

13. The lamp assembly according to claim 12, wherein said cooling means introduces the vortex into the opening such that the portion of the vortex which is reflected back towards the upper rim is coaxially contained within the portion of the vortex which travels down the concave reflective surface of the reflector.

14. The lamp assembly as claimed in claim 13, wherein the concave reflective surface defines a parabolic or elliptical opening in the reflector.

15. The lamp assembly as claimed in claim 13, wherein the opening in the reflector faces towards an optical modulator of a projection display assembly.

16. A method of cooling a lamp, the lamp including a reflector having an opening defined by an upper rim and an concave reflective surface surrounded by the upper rim, and an illumination element mounted within the opening of the reflector, said method comprising introducing a vortex tangentially into the opening such that the vortex travels down the concave reflective surface of the reflector.

17. The method according to claim 16, wherein the illumination element is coaxially mounted within the opening of the reflector, and wherein the vortex is reflected from a bottom of the concave reflective surface back towards the upper rim the reflector.

18. The method according to claim 17, wherein the portion of the vortex reflected back towards the upper rim of the reflector is coaxially contained within the portion of the vortex traveling down the concave reflective surface of the reflector.

19. The lamp assembly as claimed in claim 18, wherein the concave reflective surface defines a parabolic or elliptical opening in the reflector.

20. The lamp assembly as claimed in claim 18, wherein the opening in the reflector faces towards an optical modulator of a projection display assembly.